AMERICAN NURSERYMAN

The Nurseryman's Forte: To Make America More Beautiful and Fruitful

AUGUST 15, 1937

Lycium Chinense

AMERICAN NURSERYMAN

Chief Exponent of the Nursery Trade

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STANDARDS BY LAW.

The state of public opinion created by the program of social and business reform under the "new deal" has accelerated legislation affecting the nursery industry. While the trade itself has, by formulating standards and adopting them in organization meetings, pioneered the way, the voluntary process is being supplemented by enforcement under legal enactment. This is for the protection of ethical and businesslike nurserymen and bears down only on the negligent and irresponsible individuals who hamper the progress of horticulture by creating dissatisfaction on the part of the gardening public. One case of mislabeling or subgrading hurts out of all proportion to its own importance.

The way has been led, in enforcement of standards by law, by the state of California, well know for its strict horticultural regulations. Other states have made tentative and preliminary steps.

Nurserymen in California, it is observed by traveling among them, favor the new law for various reasons. Besides the better service to the public, greater stabilization of merchandise and prices is anticipated. Good stock, without the competition of "just as good" merchandise at lower prices, will sell at levels which will give nurserymen a better chance to pay the higher wages and the increased taxes that confront them.

Growing nursery stock because one likes the occupation is æsthetically to be commended, but from a business point of view its sale to the public at remunerative prices and with satisfaction to the purchaser is more important. Grower and dealer alike should benefit from enforcement of recognized standards, so that the extra labor of labeling, etc., may be well repaid.

AGRICULTURAL LABOR.

Two members of the Washington contact committee of the American Association of Nurserymen, Clarence Siebenthaler and Paul Stark, were at Washington, D. C., August 10 to prepare for a hearing before the collector of internal revenue in regard to the classification of nursery labor under the social security act.

In the meantime, Congress has been busy with legislation framed to control wages and hours in industry. The Senate passed the fair labor standards bill July 31 providing for a minimum wage of 40 cents per hour and a maximum week of forty hours. Agricultural labor was again exempted, but agricultural labor was defined to include workers engaged in horticulture and in the cultivation and growing of nursery products, ferns, flowers and bulbs. It is reported that this is the first time agricultural labor has been defined in an act by either one of the legislative bodies of Congress.

The bill is still in the House of Representatives as this is written, but it was reported out of the committee on labor with the Senate definition of agricultural labor unchanged as it affects nurserymen.

LOCAL GROUPS.

The development of landscape business by nurserymen in their respective communities has brought with it a type of organization little heard of a decade ago in this field. The leading firms of a city or metropolitan area have banded together to meet the problems affecting them because of local conditions. In some instances this has been the stabilization of charges for planting and service by landscape firms. In other cases it has been to promote publicity for the nurserymen's service in coöperative ways. Sometimes the operations of local political institutions needed attention; sometimes legislation was desired. Anyone who has followed the news of these groups has been aware of their activities. Such news has been published in this magazine to show what has been done, for the information and guidance of nurserymen elsewhere who have been interested in the possibility of local organization. Extended description of one such body, at Oklahoma City, appears in this issue. Much effective work has been done by these local trade groups.

LYCIUM CHINENSE.

The front cover illustration shows an excellent use of the Chinese matrimony vine, Lycium chinense. It is at its best drooping from the top of walls—making a splendid covering for unsightly ones—scrambling over rocky masses or streaming down steep embankments. In such situations it has good drainage, which is desirable, and usually not an overly rich soil, the plant seeming to thrive in comparatively poor rooting media. This sprawling shrub is drought-resistant, too, and this characteristic, together with its habits of suckering and rooting along the stems where they come in contact with the soil, suggests its use on soil-erosion control projects.

The matrimony vine is sometimes seen on cuts along railroad right of ways, for which it is admirably suited, holding the soil and at the same time presenting an attractive covering, a lively deep green throughout the summer and late into the fall. In autumn it is strikingly bedecked with bright scarlet berries, which are normally produced in great profusion. In late August and September, the small purple flowers and red fruits are usually seen at the same time, the blooming period extending from June to September, with the berries maturing from August to October.

Since Lycium chinense can be produced easily and inexpensively, it being readily propagated from hardwood cuttings, suckers, layers or seeds, it should be a good item for highway beautification work, especially for steep cuts and hillsides. Nurserymen called on to supply material or to make suggestions for such projects should not overlook this plant. Furthermore it is dependably hardy over most of the United States, withstanding 25 to 30 degrees below zero even in the absence of snow.

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[Registered U. S. Patent Office]

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Sales Promotion in the Nursery Business

Methods to Promote Sales Described at the A. A. N. Convention by Russell G. Creviston, Advertising Director of the Crane Co.

In the selling end of anyone's business, if we could always know what the customer wants, if we could always know how the customer thinks and if we should then pattern our efforts in accordance with those wants and those thoughts, we should be able to take a lot of snarls out of our distribution business. I want to stress that, to sell things successfully, you must work from the viewpoint of the buyer. You must be trying incessantly to find out what the buyer thinks about, what he wants. There is a truism that goes with that, "People don't buy what they need; they buy what they want," which is another way of saying that they buy what they are sold, because the want is generated in their minds by good selling.

I shall endeavor to make no recommendations that are not practical in their application to your business. Over the years of my experience in directing sales and promotional work, and in working with dealers and distributors, I have religiously endeavored never to mislead anyone through fanciful ideas. Time is too short, the business hours are too few, to permit chasing rainbows in the field of merchandising.

I have found this observation true. In most instances everyone is more or less in the position of the old farmer who was interviewed by a representative of the state agricultural department. The representative paraded before the farmer a number of pamphlets. The old farmer listened impatiently and then said, "I don't need these pamphlets. I know how to farm now twice as well as I am farming."

There is a lot of meat in that thought. We all know how to conduct our businesses much better than we do actually conduct them, and therefore, the first step in the application of sales promotion to a business is the creation on the part of management of a desire to apply themselves intensively and effectively.

Before we can apply sales promotional activities to any business, we must analyze the business. I do not mean analyze it superficially, but thoroughly. We must know why the public buys our materials; we must know all of the things the public wants to know about those materials; we must thoroughly understand the shortcomings of our organization; we must also understand the shortcomings of the methods of distribution which are used in distributing our products and services.

Beauty for Sales Appeal.

We start that analysis with sales appeal. Fortunately, in your industry you have the best of all sales appeals at your disposal and that is beauty. There is no other term so often used and which so many industries attempt to put to work for themselves as "beauty." You have it naturally as your theme in all promotion and selling effort. Few industries can use that theme effectively. However, when you have beauty as a theme you have to live up to that theme, because there is nothing so contrasting where beauty is the basis of sales as to have conditions surrounding the sales effort unbeautiful.

You have, as I have analyzed it, two major classes of customers, those within the nursery trade and outsiders. As producers you naturally have to interest the jobber, the landscape gardener, the landscape architect, the dealer who handles your products and the home owner, but if you can instill in the mind of the home owner a desire for beautification, you will indirectly influence all the rest of your markets.

As to markets, I found in a survey made in preparation for this talk that they divided into several classes. I think from the survey that your first market starts with the fellows who are buying lots. This year, according to present calculations, there will be in the neighborhood of 700,000 to 1,000,000 lots purchased by future home builders. The names of these purchasers can be procured either through local associations or individually.

I realize that an attempt to influence the activity of the lot buyer may be a new step to your industry, but I believe it is possible for you individually and for your association over the years to plant the seed in the mind of the man or woman who is buying a building lot that it is good business and that it is economical for him or her to start beautifying that lot in accordance with a definite plan which he or she eventually wants to achieve. Therefore, I should say one of your first markets is the new lot buyers of America, and there are approximately 1,000,000 of them this year.

Next to that you have the new home builder, and this year, conservatively, we shall build between 225,000 and 250,000 individually owned homes.

Next comes a new development, which I presume is already being attended to by some of you, but which, as a whole, you should turn your minds toward, and that is this movement back to the farm. There are thousands and thousands of people in the cities today who are buying small farms, moving out on them during the summer or over the week-end. These people have been educated to the appreciation of beautiful gardens

in the city, and their next interest is going to be landscaping and gardening along better lines than are commonly found in rural sections. Do not think the example these city dwellers set is not going to have an effect on the other farms of America. Now is the time to start planning and working with the allied groups which are able to influence that virgin market.

As you know, you have the modernization market, that constant market of improving existing home gardens, yet I find in this survey, something over seventy per cent of all the existing homes of America are unplanted or poorly planted. I find that nearly ninety-four per cent of the rear gardens are unplanted or poorly planted. In that one category, almost unlimited as to numbers, you have an extremely large market.

Next, in my judgment, comes the industrial market, and there never was a time when the idea of improving industrial property was so potent as it is today. The reason is that we are going through an era in which the watchword is more leisure, greater beauty in living and better working conditions for the man who labors with his hands. That frame of mind in which industrial America now finds itself is a potent field for you and for the educational activities of your association to approach and begin to plant the seed of better landscaped industrial establishments and grounds.

Following that is this new trend in the decoration of the parks and the highways of our country and, in that connection, you will find the state women's clubs helpful. Here in Illinois in particular, a movement is under way for legislation to make it possible for the roads to be so constructed that they can be landscaped.

I realize a market of that sort may not apply to all of you, but it applies to some of you, for by virtue of landscaping these highways over which millions and millions of people ride, they may see the benefits and the beauties created and will want them in their own homes. Therefore, while you as individuals may not benefit directly from the sale of material for planting roadsides, indirectly there is not a member of the industry who can afford to refrain from lending his efforts toward putting over that highway beautification program which is now getting started in certain of the states.

Just to prove that point, let me recite this incident. I knew I had this talk to make, and while in New York recently I had the pleasure of visiting with the vice-president of the New York Central railroad. I tried out a little idea on him, as I frequently do with my friends. I said, "Mr. So-and-so, don't you think it would pay the New York Central real dividends if they started on a program of beautifying railroad tracks and improving the appearance of stations?"

"That costs a lot of money."

"What is your major problem today?" was my next question.

He answered, "Getting people to travel on trains insead of busses and private automobiles."

I said, "You have gone to great expense in air conditioning your trains. Why not give the passengers more beauty to view as they ride by?"

"I think that is an idea worth developing," was his comment.

It is that sort of promotion your association should interest itself in. If you could get the great railway systems started to improve the property along their tracks, in an organized manner, starting particularly with the station property, think how appreciation of that newly created beauty would spread among millions of people who ride the trains. By contrast, they would begin to think in terms of their own back yards or their own front doors, and that means more business.

I analyzed the volume of the nursery industry. I found that you normally sell less than one million dollars a year. I never wish to appear in the role of a prophet, but it is my belief that your business has a normal potentiality of at least ten times that amount, and every one of you men can afford to invest a few cents toward the development of that potential.

So much for the market; so much for the groups of customers to which you are going to sell.

Sales Promotion Tools.

Briefly, let us look at the tools of sales promotion. A lot of business men think the term "sales promotion" means some sort of magic with which they can never become familiar. Sales promotion, when stepped down to its fundamentals, consists of just four definite things; first, personal selling; second, selling by mail; third, selling through the medium of the printed word, advertising, and fourth, selling indirectly through the educational method of publicity. You can bundle up all the tricks known to the trade of advertising and promotion and they will fall under some one of those four headings.

Briefly I want to point out certain fundamentals, and in so doing I shall draw a comparison between your business and the plumbing branch of the business in which I am engaged.

In the first place, the plumber is product-minded. You gentlemen are product-minded, too much so. In the second place, the plumber is an engineer and he thinks in terms of the technical phases of his product and installation rather than in terms of the comfort and convenience which that product gives to his customer. You gentlemen are artistic and scientific, and if I am not misled by this survey which I had made, you spend too much time thinking in terms of the science of your business and the artistry of your business and not enough in selling the shade of the tree, the gold of the leaves in autumn and the many other beauties which, after all, are what the public buys.

I think in both cases, the plumber as well as the nurseryman, you are prone to wait for business. You have adopted a policy of letting the public come to you.

Finally, I found this characteristic outstanding; you are afraid of selling.

Psychologically, your basic position is similar to that of the plumber. You, like the plumber, rate as an expert in the minds of your customers, and whenever a tradesman, or any man who has goods for sale, is looked up to as an expert by the man who is trying to buy from him, there are two strikes on the buyer right off the bat. In other words, the natural character or nature of your business, the fact that you know the products you are producing, that you know their care, that you know the proper artistry of putting them together in a pleasing pattern, things your buyer has not the slightest knowledge about, makes it possible basically for you to be a master salesman. You do not need the science of selling; you do not need a lot of the many things that are told you about selling. All you need to sell the buyer who comes to you are the things you know about your products. They are the best sales devices I have ever seen. I have reviewed many businesses and I have never seen as great a storehouse of sales ideas, ideas susceptible to sales promotion in all kinds of forms, as the sales ideas inherently a part of the knowledge you possess.

In order to be successful in personal selling, you should imbue your organization with the selling viewpoint. To accomplish that the only thing truly essential is for the management to become imbued with the desire to create business. The minute you, as a manager of a concern, become inspired with the desire to create more business, that desire will permeate the staff.

The next thing is to organize the

facts about your business, about your various products, about their uses, seasonally and otherwise, and make those facts available to your sales organization in an interesting and yet elementary form. A great many sales are lost in every line of business by virtue of not giving the men in the sales end the necessary tools with which to work. Therefore after training your men, you must give them the tools with which they are going to work.

Can you conceive of an army trained in the tactics of warfare sent over the top without guns, without ammunition, without gas masks? That may be a little far-fetched, but I have seen many a sales force sent over the top without equipment as vital. That equipment need not be expensive; it need not be elaborate. It need be nothing more than organized facts about the material of the business which you know so well.

When you have done that, the next thing, of course, is to give them a display of products. I am a great believer in display, and I think I have never seen an industry in which the element of display has so much romance wrapped up in it as has the display of nursery products.

I shall give you some examples that may appear fantastic today, but they will not be so in years to come. Remember them, if you do nothing else, and two or three years hence, see if I guessed wrong.

In the first place, as I ride about the country and try to buy some things from you, I am appalled at the absence of display of the products I want to buy. Would it not be simple for every nursery located along a highway to have at least some representative plantings near the roadside, with signs indicating what those plantings represent, so that I and the thousands and thousands more like me who love flowers would stop and get an idea to carry home for our gardens? Those plants could be seasonal; they could be of various types of color schemes.

Now here is one of the fantastic ideas. Did you ever try going to one of your builders to get him to build a façade of his favorite style of house that you might make a planting in front of it that would be typical for that style of house? I do not know, but I shall guess I could sell any number of builders throughout the country, as well as lumber dealers, the idea of putting up such a façade for the mere advertising value of putting up the name: "This lumber by such-and-such a lumber concern, and this plant material by such-and-such a concern."

By the same token, I have wondered as I go down the road why you nurserymen with large properties have not some sort of development and a sign that says: "Try our scenic drive." Why not route the public through a portion of your grounds and let them see the things you have for sale?

I have found your barns and other buildings, even your mail boxes—one particular mail box was so rusty I could not read the name on it—unpainted and unattractive in appearance. There is nothing that is so jarring to your buying public, the public that is buying from you for the sake of beauty, as to drive up and see a barn that needs painting, or an office building with a window so dim that the lettering is unreadable. You are selling beauty. If you are in an industry where beauty is your appeal, then you must have beauty associated with the management of that business and that includes your buildings.

Here is another wild idea. I think it might pay to experiment with the modernization of specimen houses in scattered sections of neighboring cities, merely as an example and an advertisement of what a planting could be. Vacant lots, owned by the city, as many of them are, might be used for plantings and a sign put up to the effect that the beautification of this lot is through the courtesy of such-and-such a nursery. That would bring your products into the hearts of the cities where your customers live.

"Before and After" Pictures.

I do not know whether you have used "before and after" pictures, but they are constantly used in the plumbing business. If you do not take pictures of the yards before you plant them and again after you plant them, you are missing a promotional bet. This year we spent thousands of dollars to give our dealers an album of "before and after" pictures. There is no more potent method of showing the prospect the former appearance of a house and garden in contrast to its present appearance.

Do not misunderstand me. I am not talking about a group of special salesmen; I am talking about the man who digs the hole. Anybody employed in your organization can be a salesman up to a certain point and let nobody tell you differently. We have proved it in the plumbing business, and if there is a more difficult man to work with than the journeyman plumber, I want to know who he is, and I have experience in several major industries.

But you have to give them devices; leaflets to tell the quick-growing trees, the care, and so forth. All they have to do, nine times out of ten, is to leave something with the customers. Last spring, for example, I bought five yards of special dirt from one of the good nurseries in my town. I particularly watched that transaction, not because I knew I should speak here, but because I am interested in what goes on in connection with sales problems. The order was taken by the boss. It was delivered by the truckmen, and at no time did anyone ask me what I planned to do with that dirt. Do you suppose that would have offended me? On the contrary, I should have been complimented.

You know in the Chicago area, we lost a great many perennials during the severe winter of 1935-1936. Did you send leaflets saying that many perennials had been killed and that you had some good ones to replace them? I received no such information. I had to go and take perennials away from the nursery.

Now we come to the second force in selling direct mail. I do not know how many of you have looked at the excellent display of direct-mail advertising at the back of this hall. I did not have time to analyze it thoroughly. In the main, it is very good. It is colorful, well laid out, and it depicts beauty, the thing you have to sell. The character of it, the variety of it, are sufficient to cover almost all needs, and there is no force so important in your particular business as direct-mail selling. It is second only to personal selling. Of course, your literature going to trade units has to differ from the literature which goes to the public, and both are well represented.

Speaking of capitalizing weather, I thought of something we did in the plumbing business several years ago. I asked your president if the association had ever reported the variations in the weather conditions during the year. He said that they had not. Here is why I asked that question: Until that terrifically hard winter, two years ago, when they froze to death in Florida, we could not sell them radiator heat. For that matter, we had a severe winter all through New England, New York and over the whole United States. The heating industry went out as a unit and sold the people on the fact that heat by radiation was the kind of heat that would meet all emergencies. I can say frankly that the replacements in heating boiler sales and the modernization of heating system which followed that terrific winter of 1936 were of no greater significance than a drive to replace plants which are killed by

certain conditions would be in your field.

Sales promotion by mail is a failure without an adequate mailing list. I can do no more than name the classes you should have on your list. It starts with the lot-owner class, the builders and your regular customers. It is surprising how you nurserymen neglect your regular customers! I have been buying plants from one nursery for nine years and I have never had a call from that nursery asking me my needs for spring. I have to go out there. If I did not, I assume they would never know they had lost my business. Do not neglect your customers.

Next on the list come that potential home owner and the home owner interested in modernization. People are interested in modernization, and if your business is like ours, there is better profit in the business you create than in the new business which everybody bids on.

Remember the garden club ladies. I know they are fussy old ladies, but that does not make any difference. Give me the women of America. They own over ninety per cent of the property and they do over eighty-five per cent of the buying; so do not neglect the women, even if they are fussy.

Another class on your list is the editors of the papers. We find in our business that the average editor is hungry for reliable information about our line of material, and if we give it to him, we get the breaks. Remember radio studios. There is not a radio studio that I know of that has not hundreds of hours of free time which is used by woman talkers and by man talkers on subjects of general interest to the public. Those particular types of speakers are anxious for information to use. We feed it to them by the bale. We do that, however, in our industry, through our publicity bureau, not individually to any great extent.

Schools and institutions should be on a direct-mail list. Remember, there is no finer form of advertising than to get school children, particularly those in junior high school, to visit your business and ask questions. Get them interested in learning something about making their gardens beautiful and permanent.

Two years ago we organized and spent considerable money on an educational program for girls in domestic science classes. In one year we sold over 1,000 kitchens to the homes in which those girls lived. Now we are beginning to sell kitchens to the girls in those classes. Do not overlook the youngsters.

I do not know how many prospects come in, but if I could possibly worm a prospect's name out of him, take his license number and look him up, I should never let him out. He would not come in unless he wanted to buy something. Also remember the architects, the builders, the real estate operators, the landscape gardeners and the building departments of financial institutions.

What assistance it would be to your industry if you could convince the financiers who loan money on building securities that their investments would be sounder if the property was properly landscaped. We have done it. We have sold them on the fact that the average home is not a good risk if it has not two bathrooms, and it is true. The average home needs two bathrooms; it cannot be sold or rented otherwise. The same thing applies to landscaping. You have a virgin field to sell the men who loan money on mortgages so they will require landscaping of property before they make a loan.

You should educate builders and architects to an appreciation of the importance of landscaping when they are planning the home. I suggested that before; start with the lot buyer.

Now we come to the third division of promotion, advertising and publicity. I am not going into the details of advertising except to say this: Your advertising should be more fruitful than the average advertising because you already enjoy a great measure of good will of the public. Offhand, I can think of no industry that has so much public good will as does the nursery business. Everybody loves flowers, everybody admires the beauties of nature and therefore, inadvertently, you have that good will to build on in any advertising you do. However, the analysis which I make leads me to believe that your major advertising job is an association job, and not an individual firm job. I am not ready to substantiate that belief, except on these superficial facts, but that is my own belief, based on the analysis made.

You have a wonderful theme for advertising. Advertising writers and layout men can just go "nuts" on the theme of beauty, and that is your theme. You have a natural advertising program, but it should be national in scope.

Publicity: You have many opportunties for publicity, again primarily an association job. However, I can point out where you have the opportunity to get individual publicity. I mentioned the radio, the news editor who wants pictures of "before and after" plantings. All those things are news, and he will use them and give you credit for them if they are properly presented.

In conclusion I say that you have a great industry, but it is in its infancy so far as realization of market potentialities is concerned. You have a natural application of the world's best sales appeal, beauty. Your knowledge of the products you sell constitutes the best collection of potential sales ideas I have ever seen. The organization and presentation of this knowledge is not a difficult task and should not scare any of you. You occupy in the minds of your customers the position of an expert, and whenever you do that, you have two strikes on the buyer.

You have at your command a great many willing and helpful allied sales forces, such as the women's clubs, the daily press, the radio and the garden clubs. However, you have a national educational job to do. Just as the plumbing industry sold two baths as a minimum requirement for the average home, you have the job of selling advance plantings as being economical; you have the job of selling the beautification of highways; in fact, you have an unlimited national educational job which your association, in my judgment, should be doing.

You should be more active as a group in the building industry. You are an integral part of the building industry and your association and its officers should set themselves the task of being heard in the councils of the building industry. There is no better way of registering with the architect and the builder and getting your products on the original specifications than becoming an active part of the industry of which you are at least an active allied element.

You have in your industry the problem of preparing a lot of good sales helps. In my opinion, they can be prepared on a national basis just as effectively as on an individual basis and I think the small and average-size concerns would be anxious to get your association interested in the kind of sales aids which only larger firms can produce for themselves.

While I agree with Joyce Kilmer that "Only God can make a tree," I speak for thousands of people when I express my gratitude to you who have made such products available for our daily lives and who teach us the beauty of nature. This gratitude brings good will that you can turn into profitable business simply by applying well known sales activities in your businesses individually and collectively through your association.

Growth-Promoting Substances

Practical Application of Root Growth-Promoting Substances Explained at A. A. N. Convention—By Dr. P. W. Zimmerman

Unfortunately, when work on plant growth-promoting substances became interesting, the newspaper reporters gave too much publicity to it, and then students and professors of agricultural colleges became interested. Now there are dozens of people all over the United States working on some phase of the problem.

I shall limit myself to the findings of Dr. A. E. Hitchcock and myself concerning growth-promoting substances, and these differ some from what you know as hormones. Our substances are synthetic chemical compounds which induce hormone-like responses in plants. Whether or not they will ever be found in plants is, of course, unknown. Since they produce these interesting responses, it is not unlikely to assume that some of them, at least, will be found in living plant tissue.

At the present time, however, none of these which we are now working with have ever been found in green tissue. Also, contrary to the reports which you have heard about heteroauxin (indoleacetic acid), it has never been extracted from green tissues of plants. This holds also for auxin A and B. There are some fungi which produce these compounds, but whether they ever play a part in the growth of green plants is still unknown.

The compounds in which we are interested are many. The last report which came from our institution (Boyce Thompson Institute of Plant Research, Inc., Yonkers, N. Y.) mentioned some fifty chemical compounds which might be properly placed in the category of growth-promoting substances. The word "promoting" has been attacked a number of times and, since these chemical compounds directly retard as well as promote, it was suggested that they be called "plant-retarding substances"; so it depends on the point of view.

The special interest you may have in the subject concerns the capacity of these compounds to induce new organs in this case, the initiation of roots. All of the compounds in which we are interested so far are root-inducing in nature. If we have root-inducing compounds, probably we should have, and shall have, shoot-inducing and flower-inducing hormones.

Organs probably are first induced and then regulated by naturally produced hormones. We should be able to find shoot-inducing substances, and we are looking pretty hard for them right now. That means if found we could apply them to blind wood and make new shoots appear, as we now apply the root-inducing substances to almost any part of the plant and induce roots to form.

Unfortunately, there is a lot of misinformation. We have attempted to keep the nurserymen out of research on this subject and prevent them from running experiments until we have the whole field fairly well cleared up. A lot of you like to experiment on your own hook, and you are perfectly welcome to do it, but we do not want to take the blame for it, when you fail, as has happened so many times.

We hoped in the beginning we could hold off recommendations for practical use until we worked out the requirements for the different species now used in practice. We were unable to do that, because as soon as the subject looked interesting reporters gave the work too much publicity. Then those who like to exploit saw a chance to make money from information given out only for scientific purposes. Some of the substances were put on the market with poor directions and exploited as badly as a new product could be.

Failure to Respond.

Unfortunately, we got the blame for that and I want to disclaim most of the things you have heard or read. I want to make this statement: There are many species which have not responded to treatment under the conditions under which we work at the Boyce Thompson Institute. Hardwood apple cuttings have not responded to these substances. The green cuttings of many varieties will respond readily when chemically treated. Not all apple varieties, however, respond when greenwood cuttings are used. The ornamental types are susceptible, but some of the commercial types are stubborn. In time we may find the proper treatment, but until that time we do not recommend that you use the chemicals for promiscuous propagation of apple cuttings. There are many other species which I could include with the apple as nonresponsive. On the other hand, the substances are so tremendously effective on certain species, it looks as though they must work on all others when we have the method properly worked out.

At the Boyce Thompson Institute, Drs. Hitchcock and Wilcoxon and I have located some fifty chemical compounds which induce hormone-like responses in plants. That is, when applied locally to a growing part of the plant these chemicals accelerate growth, causing swelling and bending of the treated parts. Associated with this response are cell division and the initiation of new roots; from a practical standpoint, the most important effect is the induction of roots. To prove that these compounds have root-forming power, one need only apply them to leaves, stems or flower stalks of intact plants, and roots will arise from the treated parts. If the top of a tomato plant is removed and the cut surface treated with one of these substances, roots will grow on the upper end of the stem, making a kind of upside down plant. I mention these effects only to convince you that certain chemical compounds actually have root-inducing power. My main interest on this program concerns propagation of plants with the aid of hormone-like chemicals.

Variation in Capacity.

Let us assume that under natural conditions cuttings make their own root hormones and that as these accumulate at the base of the cutting new roots are induced to form. If this assumption be true, plants differ in their capacity to make this hormone, for there are species the cuttings of which root with ease, some with difficulty, and others not at all. Under such conditions the ideal thing would be to determine what these chemicals are, make them in the laboratory and apply them artificially to the cuttings. That is just about (but not quite) what has happened. As stated earlier, we now know fifty chemical compounds which have root-inducing powers. These have varying degrees of merit, but nevertheless they all induce hormone-like responses. The names are long and need not be listed here. To give some idea of the names, here are two of the important ones—alpha naphthaleneacetic acid and beta indolebutyric acid. To save the trouble of remembering such

names, we have agreed to use the term "Hormodin" to designate root-inducing substances. Particular substances will be called Hormodin A, B, C, etc.

With the aid of these substances, we have been able to hasten the rooting of species which are ordinarily propagated by cuttings and to induce roots on cuttings of species which will not root otherwise. An adequate root system can be quickly formed and the resulting plants readily established. Some of the difficulties encountered in the past with plants from cuttings concerned a meager root system. This phase of the problem can now be eliminated.

The question is often asked, do these chemically treated cuttings produce normal roots? The only answer I can make is that the resulting root system appears normal and after being planted in soil the new plant is readily established.

Propagation Procedure.

The chemical methods as worked out at the Boyce Thompson Institute permit those who now have a method for propagating plants to continue as usual except for a 24-hour period at the beginning when the chemical treatment is given. The complete procedure, for example, calls for the following steps to propagate holly:

1. Take three to five inches of the terminal growth of any shoot and trim off the basal leaves.

2. Place the basal end in one to two inches of a water solution of Hormodin A for twenty-four hours.

3. Remove from the solution and plant in the rooting medium (preferably for holly a mixture of peat moss and sand).

4. Press the medium until it is fairly tight around the cuttings and then water well. Heavy watering at first is desirable to bring the sand particles in close contact with the stem. Thereafter water frequently enough to prevent drying. The cuttings must be kept fresh, but the medium must not be water-logged. Inspect often.

5. Shade equivalent to that which would be made by cheesecloth is advisable, though the location of a rooting medium will vary this requirement. If a frame is used, sash and slats will serve the purpose. If a propagating greenhouse is used, a coat of lime on the roof may help.

6. If temperature can be controlled, use approximately 60 to 65 degrees at night and 70 to 80 degrees during the day. Holly is not especially sensitive to temperature change.

7. Remove the cuttings in two to three months and plant in pots or nursery rows. It is well to shade or otherwise protect the newly transplanted cuttings for two to three weeks until the plants are reëstablished.

Follow Directions.

While this is a more or less complete set of directions for handling holly, it will not serve for all types of plants. Other species may have different requirements. If you try the new chemical method, be sure to follow directions, using alcoholic concentrates from which to prepare water solutions. Attempts to use crystalline material by laymen have usually resulted in failure. Many people may think that the amount of chemical specified is too small and use twice the amount called for. If they do, the cuttings may be killed. I suggest also that to convince yourself at first, keep a few cuttings which have not been given the chemical treatment and plant the two sets at the same time side by side, in the rooting medium. If there is no difference in six weeks, the chemical is not effective. However, if you follow the directions you will be sure to find a great difference between checks and treated cuttings of many species.

Approximately eighty-five genera, involving several hundred species and varieties, have been found to make satisfactory response when given the chemical treatment. Taxus and holly can be rooted in half the time required ordinarily for control cuttings. Both young and old wood work equally well. Roses and dogwood are among the most sensitive types, responding in a short time to low concentrations of the substance. Apples and pears vary with the variety. They do not respond when hardwood cuttings are used, but several varieties can be propagated readily from treated greenwood cuttings. In general, leafy cuttings of all species respond better than leafless, hardwood types. The difficulty may be that the leafless cuttings do not take up the material from solution. However it has been encouraging to find that many species, like grape, respond when both hardwood and green cuttings are used.

ELM ROOT DISTRIBUTION.

In the July issue of Nursery Notes, published by the division of horticulture of Ohio State University, L. C. Chadwick reports the results of tests made by George H. Pletcher to determine the distribution of tree roots under nursery conditions. The examinations were made on Moline elms from two to five inches in diameter under varying conditions which are fully described in the report.

The basic conclusion is that the word "feet" may be substituted for "inches" in the measurement of the trunk of the tree and one-half the roots of the tree will be within a radius of that many feet of the trunk. For example, a 2-inch tree will have one-half its roots within two feet of the trunk. Other findings depend largely on the type of soil and the kind of tree.

By examining his soil type, a nurseryman can locate the approximate position of the roots of elms and with this knowledge maximum benefits may be realized from applications of fertilizer.

Ilex Opaca Cuttings Two Months after Planting.

Native Plants of Garden Value

Fourteenth in Series of Articles on Neglected Opportunities for Nurserymen in Native Material—By C. W. Wood

The monotypic genus leucocrinum is widely distributed throughout the northwest, occurring on dry hills and plains and in mountain valleys from Nebraska and South Dakota to Oregon. I do not know why it has never become popular in the east, though it may be because it is seldom offered by nurserymen. No doubt it would become a good seller if it were only made known to gardeners, for it possesses most of the qualities of a good garden plant, including ease of culture, beauty of flower, good period of blooming and permanence. Its culture is simplicity itself, good drainage, sunshine and any ordinary garden soil being the sum of its needs. The flowers are 6-pointed white stars, set off by conspicuous yellow stamens. They are formed like large funnels with slender tubes up to four inches long, much of the tubes being underground. That makes the flowers hug the ground, giving them something of the appearance of a crocus, except that the petals are narrow. They bloom in early spring, sending up a succession of flowers for several weeks. Unlike many western plants, this one is permanent and its hardiness is unquestioned. Propagation is from seeds, which are slow to germinate and should be planted in autumn.

Liatris.

It took American gardeners a long time to realize the importance of the blazing stars, liatris, as garden ornaments and their value as cut flowers. Since we took them up in earnest, we have, however, used them lavishly until today they are one of our most important plants. They are of special interest to the grower of cut flowers because of their long-lasting qualities as well as their beauty. One of the reasons for their long life after they are cut is to be found in the fact that the flowers start to open at the top of the spike and continue downward, making it possible to break off the top as the flowers fade, thus presenting a fresh appearance until the last head has gone. Their value in landscape work is great, a species to fit almost any garden need being available.

In the cut flower group Liatris scariosa, L. pycnostachya and L. elegans are perhaps the best, their order of preference being named, according to my observation. The first two are ironclad hardy, being natives of the north and middle west respectively, while L. elegans, native to the country from Virginia to Texas, cannot be depended on in latitude 45 degrees north. Talking from the gardeners' point of view, the greatest difference in flowering habit in the first two lies in the larger heads and looser spikes of L. scariosa and the generally taller growth of the other. The first two characters make for a more graceful spike and, consequently, a better cut flower. Add to that the fact that L. scariosa is now available in a pure white form and we have a really outstanding plant in any sphere it is asked to fill. Both L. scariosa and L. pycnostachya are stately plants, getting from two to as much as five or six feet high under good culture, blooming from August until frosts.

The foregoing kinds are no more than a beginning in liatris. They no doubt include the best cut flower subjects, but most of the others are useful in that role, and all that I have grown have something to recommend them as landscape material. Of these the following may be mentioned: L. cylindracea, foot-high plant and rosy purple cylindrical flower heads; L. graminifolia, slender stems to two feet or higher and purplish flowers at the usual season (this species is not reliably hardy in northern Michigan, although its variety dubia seems to be entirely so); L. squarrosa, with large purple heads on stems six to fifteen inches high; L. spicata, rose purple flowers in spikes on stems of varying height, depending largely upon the amount of moisture it receives, the plant being the only liatris that is found naturally in wet ground, so far as I know; L. ligulistylis, a 12 to 18-inch plant, with heads of rosy purple flowers.

Generally speaking, the plants of this group do best in a light, well drained soil and full sun, though a rich heavy soil produces wonderful cut flowers. Lightness and heaviness of soil have less to do with excellence, however, than has richness. A soil that has been made fertile with well rotted manure is perhaps the best medium for growing outstanding cut flowers. These plants are easily grown from seeds, preferably planted in fall in an outdoor frame or bed. They may also be propagated from the offsets produced at the base by some species and by division.

Lithospermum.

The gromwells are rather hard to move when they are in flower, the time that most gardeners do their buying, and are, consequently, often disappointing nursery stock. They can be moved with care, however, at any time of the year providing their far-reaching roots are not too much disturbed or mutilated. Perhaps because I am specially interested in borageworts I have made a serious effort to grow all available lithospermums during my gardening days. In the light of those trials I think it can be truthfully said there is not a poor kind in the list of native species.

The puccoon, Lithospermum canescens, which is found in open situations and in partial shade, usually in sandy soil throughout eastern United States, is an excellent garden plant. Its bright, orange yellow flowers, practically without pedicels, are produced on 6 to 10-inch spikes for a month or more, commencing in May in the north. To continue the season with about the same color, we have L. Gmelinii, a plant that grows naturally in about the same situations and over much of the range of the former. The latter is usually a little taller and blooms here in June, continuing into July. Both need an acid soil, according to my observations of plants in the wild in my range. L. multiflorum is a western form of the same stature as the last-named, bearing sprays of light golden bells during June and July. L. angustifolium (L. linearifolium) is another western species, a foot-high plant with showy yellow flowers in May

and June, followed by smaller cleistogamous ones in July. There is said to be a silver-leaved form of it that would no doubt make a good garden plant if we could only get it. Gromwells may be grown from seeds with ease and that is probably the best way to propagate all except the named varieties, like the Heavenly Blue form of the European L. prostratum.

Lobelia.

Few plant groups of equal value are so much neglected as the lobelias. Quite likely this negligence is to be traced to the fact that most of them are found in moist places or in bogs. Commercial growers might well make more of our native species, not alone for the money they would attract to the cash register, but for the good of horticulture as well. Aside from Lobelia cardinalis and in a lesser degree, L. syphilitica, few native lobelias are known to gardeners. Both of the ones mentioned are perfectly hardy and would be more often used in gardens if horticultural literature were not full of the misinformation that one must have moist soil to grow them satisfactorily. It is true that they are both at their best in such situations, but they will give a good account of themselves in a humus-filled soil in a fairly dry spot in part shade. I have little success in transplanting native plants from their natural haunts to dry soil, but seedlings which have always been kept on the dry side do well under common border treatment.

The named varieties of lobelia, usually attributed to L. cardinalis, but probably more properly assigned to L. fulgens, a Mexican species, are excellent garden ornaments, but too tender for us of the north. None of these hybrids is hardy enough for outdoor use in northern Michigan, but should prove useful to growers and amateurs in more temperate parts of the country. I have been able to flower Lord Ardilaun, plants of which were carried over in a well protected frame, but Queen Victoria, Hantsman and others have always perished under the ordeal. Lord Ardilaun is a bright vermilion with dark red leaves and peculiar bronzy stems—an outstanding combination to appeal to the everyday gardener.

Two common species, L. cardinalis and L. syphilitica, are too well known to need comment here, yet many a gardener knows them not. Aside from these America has a number of hardy species, which should be better known. Of these L. Dortmanna, the native water lobelia, is a good plant for the grower of aquatic plants. It is found in shallow water, usually ten inches or less in depth, with the leaves submerged and the pale blue flowers on a scape. L. Kalmii, of northern states, is a good bog subject that seems to have been overlooked by growers and gardeners alike. Found through the northern states growing on stream banks and in bogs, it is normally six to twelve inches high, although it may get much taller. Its light blue flowers are produced in loose racemes. L. sessilifolia, which is said to occur in Alaska, is a low-growing (a foot or less) plant, bearing violet-colored flowers in abundance.

All the kinds may be grown from seeds and most of them are easily propagated from cuttings. In fact, the named kinds must be reproduced by vegetative means if they are to come true. L. Kalmii is also readily propagated by means of offsets.

TOP-WORKED FRUIT TREES.

For Home Garden.

Top-worked fruit trees offer an excellent opportunity to sell more service and materials to suburban home owners. Many home gardeners want to grow their own tree fruits, but lack of space prevents them from planting the number of trees necessary to insure a good set of fruit or to provide the succession or variety of fruit desired. For this reason many homes have no fruit trees at all. The loss is not only the home owner's, but the nurseryman's as well, for this lack can be remedied and at a profit to the nurseryman.

Most suburban gardens have room for from one to three standard-size fruit trees. If it is remembered that many fruit trees make excellent shade trees and that their ornamental value is enhanced by their blossoms and fruit, such trees may also be sold for locations away from the garden.

Trees top-worked to several varieties would avoid the self-sterile or partly self-sterile conditions that cause so much dissatisfaction where only a few trees may be grown and they could also provide a succession of fruit. Naturally, top-worked trees must be of larger caliper and sold at much higher prices than ordinary fruit trees, but the higher prices would be paid without question when the value of such trees was properly presented.

Another phase of the same situation concerns the home owner who has one or two fruit trees which have grown to a good size, but produce little or no fruit, usually because the variety is partly or wholly self-sterile. The home owner does not want to buy new trees and wait several more years, perhaps to repeat his previous experience. In such cases the service department of the neighborhood nursery should arrange for top-working the trees already growing on the property. A price insuring a reasonable profit must be charged for the first tree that is top-worked on private grounds because in most suburban communities successfully top-working one tree will start a steady flow of orders to top-work other trees and the new purchaser of such service will resent any increase in the original price.

The first cost of top-worked trees is relatively high, and much will be expected from them by their owners. To insure proper care and reasonably satisfactory results, pruning, spraying and fertilization service for such trees should be sold at the time the trees are sold or are top-worked.

The regular visits of the service department should keep the home owner in touch with the materials and services offered by the nursery and should permit the nursery to offer suggestions for improvement of the grounds. The next step is to sell the same pruning, spraying and fertilization service for all the trees and shrubs on the property and to extend the same service to the neighborhood as rapidly as it can be sold. Profits on small jobs increase if travel costs are spread over several jobs done on one trip.

THE library of the Arnold Arboretum contains approximately 43,000 bound volumes, 18,000 photographs, 12,000 pamphlets and several thousand nursery catalogues. Included in this list is a nearly complete set of the botanical works of Linnæus and many of the original Linnæan dissertations.

City Retail Association

Work Accomplished at Oklahoma City Demonstrates Great Value of Local Nurserymen's Organizations

The Oklahoma City Retail Nurserymen's Association was organized August 4, 1933, in an effort to comply with the N. R. A. A code of fair practices was formulated, and ninety-six per cent of those engaged in the nursery business in Oklahoma City signed up. Meetings were held every week until it was definitely known that the nurserymen's code would not be promulgated. The members with heavy investments in the nursery business were so well pleased with the results of regulation and fair trade practices that it was decided the association should be continued under the existing agreements. Up to the present time these rules and regulations are still in force. Of course, there is no legal penalty that can be attached.

There is no more loyal trade group in the United States than this band of twenty-six members, who comprise ninety-six per cent of those at present engaged in the sale of nursery stock in the city. They have learned that coöperation is the solution of most of our difficulties. They work with the Oklahoma City Florists' Club and also with the Oklahoma State Nurserymen's Association and the Oklahoma State Florists' Association. Meetings are held on the first Tuesday of each month, and at intervals called meetings are held if there is anything of importance to make such extra meetings advisable.

The association undertakes to coöperate with the civic bodies and societies where it affects the sale or giving away of their products. It fought successfully the selling or giving away of nursery stock by the municipality; today the city government has abandoned that practice.

The members were not satisfied with the nursery laws of the state and were more displeased with their enforcement. Today, with the coöperation of the state nurserymen's association and the state florists' association, they have secured a workable inspection code—one that is fair, reasonable and equitable, with which all members feel able to comply and which will build respect for the nursery and florists' industries of the state.

The members of the association do not attempt to control prices, as they had to under the N. R. A. set-up, but the advantages in this control were so evident that every member by tacit understanding felt it would be business suicide not to continue along those lines. Persuasion, common sense and man-to-man talks have accomplished much, and today Oklahoma City has probably the largest local nursery organization in the west.

J. A. Maddox was elected secretary-treasurer of the organization two years ago. His policy of keeping members informed of the things that were happening relative to their business caused his election as secretary-treasurer of the Oklahoma State Nurserymen's Association. Since he has been secretary of the latter organization, the membership has increased nearly 100 per cent and it is hoped to have every nurseryman in the state a member this year. The president is C. Y. Higdon and the vice-president is Fred Garland. With the president and secretary the executive committee comprises J. F. Semtner, J. Frank Sneed and V. E. Bryan.

The Oklahoma nurserymen and florists petitioned the president of the state board of agriculture that Mr. Maddox be made a deputy inspector; this appointment has been made. The nurserymen are proud to have Joe C. Scott as president of the state board of agriculture, for they feel that he will see that the law is enforced as it is written. With such enforcement conditions in the nursery industry will be improved.

J. A. Maddox.

Mr. Maddox, now 61 years old, has been actively engaged in nursery work since 1914, at Oklahoma City since 1918. In previous years he engaged in propagating and growing, but more recently has devoted his efforts almost exclusively to landscape work—when he was not devoting his time to trade organizations.

SHADE TREE ANTHRACNOSE.

Anthracnose of shade trees is causing an unusual amount of damage along the Atlantic seaboard this year because of a season favoring its development. The New Jersey agricultural experiment station reports that, as usual in an epidemic year, the native plane, Platanus occidentalis, and the white oak, Quercus alba, are severely infected and that the London plane, Platanus acerifolia, heretofore considered fairly resistant to anthracnose, is so badly infected in the southern counties of Cape May and Cumberland that complete defoliation has resulted on many trees.

The severe infection this year means a heavy production of twig cankers to produce spores next spring. A dormant spray of lime-sulphur (1-9) plus at least two applications of 3-4-50 Bordeaux a week to ten days apart during leaf growth is advised to prevent further infection.

COMING EVENTS.

August 20 and 21, Ohio Nurserymen's Association, summer meeting as guests of Cincinnati Landscape Association, Netherland Plaza hotel, Cincinnati, O.

August 23 and 24, Virginia Nurserymen's Association, annual convention, Blacksburg, Va.

August 25 and 26, Michigan Association of Nurserymen, summer meeting, Olds hotel, Lansing, Mich.

August 25 and 26, Southern Nurserymen's Association, annual convention, Nashville, Tenn.

September 1 and 2, Texas Association of Nurserymen, annual convention, Austin, Tex.

September 1 to 3, National Shade Tree Conference, annual convention, Lord Baltimore hotel, Baltimore, Md.

September 13 and 14, Northern Nut Growers' Association, twenty-eighth annual convention, Washington, D. C.

September 22 to 24, California Association of Nurserymen, annual convention, Hotel Oakland, Oakland, Cal.

Damping-Off Control

Methods by Which Seedlings May Be Protected From Damping-Off Fungi — By L. C. Chadwick

Damping-off is caused by at least three different fungi—pythium, rhizoctonia and botrytis. Their attacks on young seedlings may be (1) as the shoot emerges from the seed or before it reaches the surface, (2) at the surface in such a way that the seedling topples over and (3) at the roots, causing a stunted growth. The first method of attack is frequently overlooked, since the seedling never reaches the surface of the soil and the propagator frequently attributes the unfavorable results to poor seed.

For media which are to be used in the greenhouse or close adjuncts, the method of controlling damping-off that is most frequently practiced and, possibly, in the long run is the most successful, is sterilization with heat. Steam and more recently electricity are used to furnish this heat. Maintaining a constant temperature of 155 to 160 degrees Fahrenheit for two hours within a closed box is sufficient to destroy the destructive fungi when steam is used. This box method is practical when soil or sand is to be used in seed flats or a limited bench space. When seeds are to be sown in flats, always remember to sterilize the flats as well as the medium.

Steam, Electricity and Hot Water.

For large areas of bench space, sterilization may be practiced by laying tile in the bench and piling the medium over it. The bench is covered with a canvas or other suitable material and the steam turned on. Temperatures should be checked carefully to assure a satisfactory control.

Soil may be sterilized electrically by the use of a suitable box wherein the electrodes are placed horizontally, one at the top and one at the bottom, connected to opposite lines of a 230-volt circuit. For satisfactory results the soil should contain ample moisture, as for satisfactory planting. The soil should be heated to a temperature of 115 to 125 degrees Fahrenheit and then allowed to cook for twelve hours. This electrical method gives satisfactory control of damping-off caused by pythium and to a lesser extent by rhizoctonia and botrytis. A partial killing of weed seeds, insects and nematodes likewise occurs.

For limited areas, hot water has also been used. Approximately seven gallons of boiling water per square foot of bench or bed area must be applied. This method of sterilization is not dependable for depths over three inches and leaves the soil in rather poor physical condition.

Chemicals are effective against most soil-borne pathogens, but may not readily kill the botrytis fungus. The following are among those most frequently employed.

Formaldehyde.

A formaldehyde drench is often employed for bed areas for seed. The solution used is two to four quarts of commercial formaldehyde to fifty gallons of water. This is applied at the rate of two quarts per square foot of loosened and slightly moistened soil. After treating, cover the bed for twenty-four to forty-eight hours with canvas or burlap. The soil must be thoroughly aërated by shoveling over the soil. Ten days or two weeks should elapse before the seeds are sown. This method of control is frequently used in nurseries and gives good results.

Recently a number of commercial forms of formaldehyde dust have appeared in the trade. While directions should be followed as given for each type, some of them at least are a six per cent dust and are mixed with the soil at the rate of one and one-half ounces per square foot of soil when it is two to three inches deep, as it occurs in flats, or about eight ounces per bushel of soil. After mixing, the soil should be watered before the seeds are planted. These dusts have proved effective with seeds of many types of herbaceous annual and perennial plants.

Sulphuric acid has long been used for the prevention of damping-off of conifer seedlings. It is used by applying three-thirty-seconds to three-sixteenths ounce of commercial concentrated sulphuric acid to each square foot of area at seeding time, after the seed has been sown and covered. It is often recommended that it be used with one to two quarts of water to aid in its even distribution. Some types of spruce have been reported to be injured by this treatment, but nevertheless it is used extensively in forestry nurseries.

Potassium permanganate has been used for treating rooting media for cuttings more extensively than it has for seeds. For seeds it probably is not so effective as the sulphuric acid or formaldehyde, in most cases. It is used at the rate of one ounce per gallon of water, applied at the rate of two quarts per square foot of surface.

A number of dusts have been advocated at one time or another for seed treatments to prevent damping-off. A number of mercury compounds have proved partially successful, but have not improved the stands of seedlings of many annuals and perennials and have proved toxic to others.

Copper Oxide Dust.

More recently copper oxide dust has been recommended and has given good results with many seedlings of herbaceous annual, perennial and ericaceous plants under glass and to a more limited extent with seedlings of woody plants in outdoor beds. The dosage to use is two and one-half per cent by weight, or one level teaspoonful per pound of average-size seeds. With large seeds one-quarter to one-half per cent is sufficient. A few types have shown a tendency to be injured by such a treatment. Low organic matter in the soil, drought or presoaking of the seeds may result in injury. The seeds and the required dust can be placed in a sack and shaken thoroughly, so that each seed becomes coated with the dust. Sowing can take place at once. The writer has found that dusting seeds of woody ornamentals with copper oxide dust has aided in preventing the development of mold and other fungi during the stratification period.

While copper oxide dust may aid in preventing serious attacks of the damping-off fungi below the surface of the soil, it aids little in preventing the development of fungi that occur at the surface of the soil. As an aid in preventing post-emergence attacks, zinc oxide, or zinc white, has been advocated as a soil dressing. This dust is used at the rate of two-thirds ounce per square foot of surface. It should not be mixed with the soil, but applied as a dressing at the time of seeding, so that the seedlings emerge through it. No extensive tests have been reported for the use of zinc oxide with seedlings of woody plants, but it has worked well with seeds of vegetables and of herbaceous annuals and perennials handled in the greenhouse. The use of the copper oxide as a seed treatment, followed by zinc oxide as a soil dressing, is now often recommended.

In conclusion, as a means of suc-

cessfully combating the attacks of the damping-off fungi, I should recommend steam or electrical sterilization if possible, especially where small quantities of soil or sand are to be treated. Copper and zinc oxide dusts have proved satisfactory for seeds of many herbaceous annual and perennial plants handled under glass, but have not been tried extensively for seeds of woody ornamentals handled in outdoor beds. Dusting seeds of many woody ornamentals before stratification has given some promise of being beneficial. The use of formaldehyde solution or dust and sulphuric acid as practiced in forestry nurseries may still be advocated, although it is not entirely satisfactory.

NEW DUTCH ELM CASES.

The United States bureau of entomology and plant quarantine reports the finding of three trees infected with Dutch elm disease near the Western Maryland railroad tracks on the West Virginia side of the Potomac river, south of Cumberland, Md.

The number of infected trees found in Connecticut, New Jersey and New York this year, 2,728, is about twenty-five per cent less than last year. In all other states twenty infected trees were found up to July 24 this year as compared with fifteen in 1936.

PLANT DISEASE REPORTER.

The following excerpts are from the July 15 issue of the Plant Disease Reporter, United States Department of Agriculture.

Several counties in New York report serious infections of quince rust, Gymnosporangium germinable, in apple orchards. In western New York Early Richmond cherries are showing a breakdown condition similar to stippen in apples or drought spot in prunes. The fruit seems to be outgrowing it to some extent, but it is leaving browned areas in the cherries.

Black spot on roses in the District of Columbia is general and severe on unprotected roses. Many bushes located in partial shade or receiving only a few hours of sun each day have been practically defoliated.

What appears to be a new disease of persimmon has been found in central Tennessee. The infected area is limited to a 12-mile strip between two parallel ranges of hills in Rutherford and Cannon counties. The external symptoms of the disease are those typical of a vascular infection causing wilt. On trees badly infected last summer only small, chlorotic leaves appeared this spring and by June such trees were dead. Seemingly it is but two or three years after infection before the tree dies. The area from which the first infection was reported in 1933 or 1934 now contains no living trees. Adjacent areas have eighty per cent of the trees dead and the remainder infected. Internal symptoms of the disease consist of black streaks running through the wood. These streaks are not confined to any particular annual ring, although in dying trees they are heavier in the outer sapwood. A single fungus, cephalosporium species, has been consistently isolated.

Massachusetts reports an unusual amount of spray injury where lime-sulphur or lime-sulphur and lead arsenate sprays were used early in the season. Extremely tender foliage developed during the unusually damp, cloudy weather, which also was not conducive to drying of sprayed foliage, combined with the necessity of using lime-sulphur to combat the heavy infection of scab seems the main reason for this injury.

BLACK STEM RUST QUARANTINE.

A revision of the black stem rust quarantine, No. 38, and regulations supplemental thereto, effective September 1, 1937, was announced August 9 by the Secretary of Agriculture. The revision adds the states of Missouri, Pennsylvania, Virginia and West Virginia to the list of states designated as protected in notice of quarantine No. 38, as revised effective August 1, 1931.

Under the revision effective September 1, 1937, the interstate movement of all barberry and mahonia plants except the Japanese barberry, Berberis Thunbergii, and its rust-resistant varieties, into or between the states of Missouri, Pennsylvania, Virginia and West Virginia, as well as into or between the states of Colorado, Illinois, Indiana, Iowa, Minnesota, Michigan, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin and Wyoming, which were previously designated as protected states, is restricted.

Nurseries which desire to ship immune species of berberis and mahonia into the protected states must submit application to the bureau of entomology and plant quarantine, Washington, D. C., for permits. Inspection of the nurseries involved may be denied if such applications are not received prior to June 1 (September 1 for the present calendar year) covering shipments proposed to be made during the next fiscal year. The fiscal year begins July 1 each year.

FLORIDA'S CLEVELAND EXHIBIT.

The Florida outdoor exhibit at the Great Lakes Exposition, Cleveland, O., includes more than 100 different varieties of plants brought from tropical sections to flourish on the shores of Lake Erie.

Of palms alone there are sixteen varieties, including royal, Cocos plumosa and coconuts ranging from twenty to thirty feet in height. Azaleas, gardenias, hibiscus and other flowering shrubs are shown with many useful exotics, such as the orange, grapefruit, lemon, lime, kumquat and other varieties of citrus fruits bearing fruit and in bloom.

Maryland Meeting

Experiments at the Federal Horticultural Station Explained by Government Horticulturists in Charge

The summer meeting of the Maryland Nurserymen's Association was held, through the courtesy and coöperation of the United States Department of Agriculture, at the horticultural station at Beltsville, Md., August 3. The weather was fine and a good number of nurserymen from the middle Atlantic area were on hand early. There were eighty-two registrations, and Pennsylvania, Virginia and West Virginia furnished the same number of individuals as Maryland, with a few from New Jersey and New York.

As fast as a group of twenty-five could be registered, they were sent off with a guide to cover the program laid out for the morning. Before going through the greenhouses, each group had the planting of the main buildings explained to them by Dr. Mulford.

The first greenhouse contained some of the work that is being carried on to determine the resistance of roses to various diseases. Here Dr. Freeman Weiss displayed and explained the pathological equipment used in the work. Of particular interest were the petri dishes, each containing a piece of moist paper on which was laid a rose leaf that had been inoculated with black spot to determine the resistance of varieties to this disease. Under laboratory conditions the rose leaf remains alive long enough in these dishes to develop a good test for black spot and any differences shown in infection, when handled in this manner, are due to real resistance and not merely to environmental conditions.

Black Spot on Roses.

As a result of these tests, it has been found that none of the hybrid teas has any resistance to black spot. Rosa bracteata, to all purposes, was found to be immune, and other species were found that had a high resistance to the disease, but none of these types has entered into the parentage of the commercial rose of today, other than in the climbers.

Apologies were made for the lack of spray work, but it was explained a large block of uniform material is needed for this and it is not obtainable at the station; consequently, this type of work has been done in coöperation with some of the large commercial growers throughout the country. Sulphur dust has been found to be the best all-around control.

The question was asked, "What is a good rose spray for black spot?" The best control has been obtained by dusting with sulphur. It is believed, however, better to omit dusting the plants in the summer and to take it up again when the weather is a little cooler. The best time for application is in the evening before the dew has fallen. The difficulty with sulphur sprays is in getting a good spreader, but in extremely cold sections spraying is superior to dusting, because sulphur does not oxidize sufficiently to be effective at temperatures below 70 degrees Fahrenheit. The work with rose mosaic was explained. Samples of understocks were received from all the large rose growers on the Pacific coast. These were tested by budding healthy Butterfly on them. Little mosaic was found and what did show up caused a little puckering of the leaf, with a slight shortening of the flower stem, but there was no great influence on the plant.

Boxwood Investigation.

Boxwood is being investigated to determine the factors involved in canker and wilt and to see if the trouble is comparable to the Dutch elm disease. Both forms have been inoculated, but no fungus has been found that attacks normal healthy boxwood.

In the trials with phloxes it has been found that the common perennial and annual garden phloxes, as well as the native species, are generally susceptible to leaf spot. The variety Miss Lingard is the only one thus far found that is highly resistant to this disease. Efforts are being made to get resistance into the decussata types by using Miss Lingard as a parent.

Dr. Siegler explained a group of experiments on crown gall in connection with different ornamental plants, a continuation of his experiments made with fruits. Kalanchoë Daigremontiana, a possible source of rubber, has been used in the tests for this disease. Great stress was made on the necessity for cleanliness while grafting and in keeping the cut surfaces free from contamination. Nurserymen's tape was suggested for wrapping grafts, and a demonstration was made using Parafilm for this work. The latter material will hold up on buds and grafts for several months.

Fertilizers and Apples.

Dr. Batjer explained the extensive experiments that are being made to determine the effect of nitrogen, phosphorus and potash on the growth and development of apple trees. The trees were planted in pure sand, being one-year-old root grafts at the time. All the necessary elements were supplied, with variations in nitrogen, phosphorus and potassium supply. When varying quantities of nitrogen were added to one batch of trees, it was found that the higher amounts of nitrogen produced a more vigorous tree with large leaves and stockier trunk. As nitrogen was decreased, growth became more spindly and leaves became smaller and of a lighter color. It was found, while a low potassium content produced a fairly satisfactory tree with no visual deficiency symptoms, a higher potassium content produced a healthier and more vigorous tree. An absence of potassium resulted in a weak tree and scorched leaves, which are characteristics of potassium deficiency for most plants. In the variation of phosphorus content, it was evident that only a little phosphorus is necessary for the growth of apple trees. A complete lack of phosphorus, however, produces small, thick, leathery leaves and a spindly growth.

Dr. Brierly displayed the work being done on aster yellows. All obtainable varieties of China aster are being tested for resistance to yellows. These tests are made by caging yellows-carrying leaf hoppers with the test plants. Under these drastic conditions, all varieties proved susceptible, but in the open field some types of asters escaped. This may not be due to resistance to yellows, but to some character that repels the leaf hopper. Tests are being made in the field to find whether practical resistance of this sort can be developed.

Temperature Control.

Prof. Victor Lumsden explained the equipment and methods used in the experiments being conducted to modify the chromosome counts in order to develop new varieties of ornamental plants. In the preliminary work, plants are grown under absolutely controlled temperature and light conditions in an especially constructed chamber to determine the exact time that transpires between pollination and fertilization. When this has been determined, another group of the same plants is grown under identical conditions, and when the period of pollination and fertilization arrives, live steam is introduced into the chamber to build up a high degree of heat.

In order to produce as close to a killing temperature as possible, yet not kill the plant, the temperatures of the tissues of the plant are closely observed during the period of applying the heat by an ingenious use of electrically controlled thermocouplers. Lilies, narcissi, tulips, nasturtiums and other types of plants are being treated in this cham-

ber, and the professor stated that within the next two years the results of the first treatments can be seen.

Dr. Frank Gardner explained the experiment for determining the resistance of apple trees to the woolly aphis. There is sometimes a loss as high as twenty-five per cent on apple trees from woolly aphis galls, and different stocks are being tested for their resistance to this insect. The aphis are planted on trees growing in pots in cages, and ideal growing conditions are supplied. So far, all stocks and varieties tested have proved susceptible to the attacks of the insect.

Propagation.

Dr. Gardner then explained propagation by etiolation. This was done with apples. Two methods are used. In the first method, when the new shoot has made about an inch to an inch and one-half of growth in the spring, this area is then wrapped spirally with ordinary black insulating tape. Growth is allowed to proceed as usual and, in the fall or following spring, the cutting is taken, the tape removed, the cut made at the base of the yellow or etiolated section and the cutting placed in the propagating medium. It is only a question of a few weeks before sufficient root growth is made so the cutting can be potted up.

The second method consists of making tubes five inches long and one-half inch in diameter out of black or alligator hide mulching paper. These are placed over the terminal bud before growth starts in the spring and allowed to stay on all summer. In the fall or following spring the same procedure is followed as in the first method. This paper tube method is more effective than the tape, as etiolation takes place from the very beginning of growth, and it is not unusual to find, when removing the tube in the fall, that roots have already commenced to develop up the etiolated area. These methods work successfully with apples and lilacs, but have failed with cherries. It is thought, however, that this will be a general method of propagating plants that are difficult to root.

He next showed the group a collection of peach seedlings of commercial varieties which are being tested in the field for peach understocks to take the place of the wild pits, or North Carolina naturals, which are rapidly disappearing. These seedlings consist of about 100 different varieties of peaches and will be budded to several of the standard commercial varieties. In addition to compatability with scion variety and the vigor of growth which will be induced by the various stocks, investigations are also being conducted on resistance to crown galls, nematodes, root rots and low temperatures.

He showed a collection of holly species which are kept for study in breeding work and the use of hormones. It has been found that a 100 per cent set of fruit can be obtained on the hollies by spraying the flowers with indolebutyric acid in an aqueous solution at a concentration of 0.06 per cent. Fruit obtained in this manner is parthenocarpic and does not contain viable seeds.

Guy Yerkes explained the testing of indolebutyric acid, a root-stimulating substance. He is trying to bring out the practical value of this material in the propagation of conifers and other ornamental plants. Solution strength and time of treatment are being investigated. In

these tests the lower ends of the cuttings are immersed in varying strengths of the chemical dissolved in water and allowed to remain for periods varying from four to twenty-four hours. Some lots, which were ready at the time to show the result of the treatment, were displayed in water so that the difference in rooting could be readily seen.

The examples shown would indicate that solutions of 1/100 of one per cent to 1/5000 of one per cent result in a considerable increase of roots. It appears that the use of this chemical under the right conditions results in a much shortened time required for the cutting to be in the rooting medium. It was explained that favorable conditions, with respect to the stage of growth of the cutting and careful handling while in the rooting medium, are necessary to secure the best results from the treatment.

Dr. S. L. Emsweller explained the work he is doing in breeding to obtain strains of stocks that will throw a high percentage of doubles. He stated that the larger and more vigorous seedlings are the ones that throw double flowers and that there are strains which produce fifty per cent doubles and others which produce only twenty-five per cent doubles. The aim is now to develop a race or strain that will give as high a per cent of doubles as possible. The statement was also made that if the temperature is high the plants will not bloom and that length of day, or amount of daylight, also affects the blooming. It was suggested that three days at a low temperature will bring back to a normal state plants that have had too high a temperature at the start, and the longer time at the low temperature the more strongly they will bloom. Plants started at a low temperature do not get along so well as those started at a high temperature and later moved into a low temperature.

Dr. Brierly showed and told how lilies are being tested for susceptibility to mosaic and how efforts are being made to get clean stocks of Easter lilies adapted for American culture by crossing all types of Lilium longiflorum in order to improve forcing qualities and resistance to disease. He also told of the work being done with snapdragons. The first rust-resistant types were developed on the west coast. There is a possibility of strain differences existing between the western and eastern rusts. Efforts are now being made to develop better horticultural types which will be resistant to the eastern rusts.

Dr. Gardner explained an apple planting in the field where there were a number of stocks which have been propagated from root cuttings of known variety seedlings and on which are being tested five or six of the leading commercial varieties for orchard work. Some of these selected stocks are giving indications of superiority over the commonly used commercial seedlings.

He also explained a demonstration of apple varieties on their own roots which are being tested for hardiness. These have been propagated by means of wire-wrapped grafts. Ordinary whip grafts are girdled with copper wire at the time the graft is made and at the end of the first season the nurse root sloughs off and the scion is on its own roots. Apple stocks which have shown desirable characteristics such as winter hardiness, resistance to woolly aphis, etc., are being propagated by root cuttings and given further tests as to their compatibility with commercial varieties.

Mr. Yerkes displayed a plot where Japanese multiflora seedlings are being grown for field budding and to be compared with another form, multiflora Chenault, which was discovered by a missionary in China. The latter variety is now being used by several large nurseries in preference to the Japanese form. It is unusually vigorous and imparts its vigor to the hybrid teas which are budded on it.

Dr. Gardner explained the tests that were devised to show the relative value of different nitrogen carriers as compared with manure in fertilizing evergreens, the proper amount of fertilizer to apply and also if any value is to be derived from phosphorus and potassium. The results to date disclose that inorganic fertilizer applied in the correct proportions can be used with equally good results as manure and at considerably less cost. Manure is a prized commodity, but one difficult to obtain. In general, the best results were obtained by a complete fertilizer; that is, one containing nitrogen, phosphorus and potash. Too heavy an application of commercial fertilizer will easily result in marked injury. This is particularly true of the concentrated nitrogen carriers, such as nitrate of soda, which on evergreens 3 to 5 years old should not be used in amounts greater than 300 pounds per acre. It was found that susceptibility to nitrogen injury varied with the different varieties, the Irish juniper standing more injury than the arbor-vitæs.

Guy Yerkes showed the effect of understocks on Juniperus chinensis columnaris. Comparison of this juniper propagated by cuttings with grafts on J. horizontalis plumosa and J. communis suecica showed distinctly stronger growth from own-root plants. The use of the tall-growing J. suecica resulted in dwarfing, but maintained the characteristic form. On the other hand, the low-growing J. horizontalis plumosa produced plants with a distinctly broad pyramidal form rather than a columnar one.

Time did not permit of a close examination of the orchard of color sports of apples or of peaches propagated on twenty-seven different stocks.

Dr. Emsweller explained the rose collection in the field. It is believed to be the largest collection of species in the world and is used for the study of black spot. In it are a collection of Van Fleet which shows a strong resistance to this disease and a Rosa xanthina which is practically immune.

Work with Chrysanthemums.

Dr. Mulford displayed his chrysanthemum work. He stated that more than twenty years ago horticulturists became interested in the difference in the number of mums in the south and in the north. By using these two types they tried to develop a strain which would bloom from late September to early October and which would be hardy in the north. The results of these crossings are continuing to furnish material for further work along these lines. Some of the plants are already in bloom, which is entirely too early. Tests of selections from this planting have been in progress for four years in ten different stations in Wyoming, North Dakota, Wisconsin, Michigan, New York, Iowa, Illinois, Pennsylvania, two places in Ohio and in Oklahoma.

A study is also being made of the inherited qualities of mums. Selected plants are being selfed and the progeny grown on.

Dr. Cullinan told of and showed the work that is being done with peach trees under different soil conditions. Most growers use a clean field without a cover crop. This practice is responsible for a great deal of soil erosion. The department is endeavoring to use a cover crop of soy beans, rye and vetch to prevent this erosion. The soy bean is also an effective protection against the Japanese beetle. It was interesting to note that where a cover crop of buckwheat was used no weeds developed. Peach trees do not do so well in grass as apple trees, because an annual sod seems to withdraw the water from the soil. Although the peach trees still show the best result in gravel, the use of a cover crop does not seem to set them back to any great extent and will prevent the erosion of the soil, now a major problem in the United States.

There was also shown an apple orchard of three varieties, York, Starking and Rome Beauty. It was planted in 1932 and special effort was made to treat all the trees in exactly the same manner. Most vigorous trees are obtained by breaking up the soil in the spring and giving a thorough irrigation.

Lunch Outdoors.

About 1 p. m. the different groups began to assemble at the log cabin where a good cold buffet lunch was served which was taken outside and eaten from benches and tables set up under the trees. We were fortunate in having Dr. E. C. Auchter, assistant chief of the bureau of plant industry as our luncheon guest and when everyone was through eating he was introduced and asked to give a short talk.

"We are pleased to have you with us today," Dr. Auchter said. "I am particularly glad of the opportunity to say something about this organization and the several other similar organizations we have throughout the United States. In the government we have many de-

partments. Our group is in the Department of Agriculture, which consists, in turn, of many bureaus, including this bureau of plant industry. We are interested in the propagation of all plants, from cotton in the south to the potato industry in Maine, as well as in subtropical fruits, etc. We have many substations, but this is our national headquarters. For many years we did not have suitable land for our experiments and then, about five or six years ago, we secured funds for this station near Washington. This whole establishment has been built, therefore, since that time.

"There may be, in the minds of some of you, the thought that this station competes with the state experimental stations, but this is not so," Dr. Auchter continued. "It coöperates with them! We are trying to work not only on Maryland problems, but also for New York and all other parts of the United States. As I have gone over the United States in the last three or four years, I have been impressed by the need for the development of improved plants, resistant to various diseases and to drought, co!d and other conditions. We are breeding all sorts of vegetables, fruits and flowers with this idea in mind. We have brought in rootstocks from various foreign countries and have developed a great many here as well. We believe that it is of value to all growers in the United States and not just here in Maryland.

"Another point is that of disease control," he said. "This bureau is in charge of all experiments for control of disease. We are doing research work in various biochemical and horticultural problems. If we find certain differences in plants, we try to find just why we get these differences—how to cause them and how to prevent them. We want to know what it is that brings each response and to try and find a cheaper method of producing the same result, when that result is desirable. I merely want to point out that we are trying to improve conditions for nurserymen and growers all over the country."

In the absence of Frank Primrose, president of the association, Jesse E. Stoner, vice-president, gave a short speech of welcome to those present. Lee Hoffman, president of the Outdoor Life Association, gave a short talk of the great show that that organization will hold next February 11 to 19 in the Fifth Regiment armory, Baltimore, Md.

As it was felt that a great deal more benefit would result to those attending the meeting if there were not speeches and introduction to take up time, no one else held the center of the stage.

At Bell, Md.

At 3 p. m., everyone got in their cars and the group headed for the trial gardens at Bell, Md. A short cut was taken across country through the resettlement administration village of "Tugwelltown." The road was dusty gravel and the group looked like a tribe of redskins by the time it arrived at Bell.

Dr. Bradford and Albert Close exerted every effort to explain the workings of the station, but they were up against it with such a big crowd. However, everyone seemed to enjoy himself. All went through every greenhouse, except the quarantine houses, and through every field plot. As everything was labeled, there was little difficulty in identifying material.

Julian J. Chisolm, II, Sec'y.

Coming Events

VIRGINIA ANNUAL MEETING.

The annual meeting of the Virginia Nurserymen's Association will be held August 23 and 24 at the Virginia Polytechnic Institute, Blacksburg, Va. Members and guests will be lodged in one or more of the new stone dormitories and all meals will be served in the college dining hall. Only a moderate sum will be charged for meals and lodging, but to enable necessary arrangements to be made it is requested that everyone expecting to attend the meeting communicate with A. G. Smith, Jr., V. P. I., Blacksburg, as soon as possible. The program is planned as follows:

MONDAY MORNING, AUGUST 23.
Registration in War Memorial building.
Address by Kenneth McDonald, president of the Virginia Nurserymen's Association.
"Fertilizers," by Prof. L. C. Chadwick, of Ohio State University, Columbus, O.
Reports and appointments of committees.

MONDAY AFTERNOON, AUGUST 23.
"Report of the meeting of American Association of Nurserymen," by E. M. Quillen, of Waynesboro Nurseries, Inc., Waynesboro, Va.
"Washington Representative, American Association of Nurserymen," by Owen G. Wood, of the Wood-Howell Nurseries, Bristol, Va.
Tour of V. P. I. campus.

MONDAY EVENING, AUGUST 23.
"Organizations," by Prof. L. C. Chadwick.

TUESDAY MORNING, AUGUST 24.
"Relationship of Commercial Fruit Grower to Nurseryman," by Frank H. Wissler, president of the Virginia Horticultural Society.
Open discussion of problems affecting florists and nurserymen, led by Prof. Alex Laurie, of Ohio State University.
"Suitable Understock for Nursery Material," by A. H. Teske, department of horticulture, V. P. I.

TUESDAY AFTERNOON, AUGUST 24.
Recreation and unannounced special features.

It is interesting to note that the third annual pilgrimage and short course for garden lovers, sponsored by V. P. I. in coöperation with the Virginia Federation of Garden Clubs, will be held August 25 and 26 at V. P. I. and that a study of an exhibit of ornamental plants and other material arranged through the courtesy of Virginia nurserymen is the first thing on the program for August 25.

NASHVILLE FEATURES.

The entertainment features of the annual convention of the Southern Nurserymen's Association to be held August 25 and 26 at the Andrew Jackson hotel, Nashville, Tenn., have already been described in this magazine. W. C. Daniels, secretary of the association, has written describing the more serious aspect of the meeting. The whole program is well balanced and should be appreciated by everyone in attendance. The names of the speakers and their subjects are as follows:

"Recent Scientific Advances in the Production of Nursery Stock," by Prof. L. C. Chadwick, of Ohio State University, Columbus, O.

"The Bureau of Entomology and Plant Quarantine," by Avery S. Hoyt, assistant chief, bureau of entomology, United States Department of Agriculture.

"The Home Orchard Situation," by L. A. Niven, associate editor of the Progressive Farmer, Memphis, Tenn.

"Selling," by E. M. Quillen, of the Waynesboro Nurseries, Inc., Waynesboro, Va.

"Conservation of Our Natural Resources," by Samuel F. Brewster, commissioner of conservation, state of Tennessee.

"The Railroad's Store," Earl Roach, general agent of the N. C. & St. L. railway, Nashville, Tenn.

"New and Better Perennials," by J. J. Grullemans, of the Wayside Gardens Co., Mentor, O.

"Some Legislative Matters," by Harry Nettles, of the Nettlewood Nurseries, Asheville, N. C.

OHIO SUMMER MEETING.

The Ohio Nurserymen's Association will hold its summer meeting August 20 and 21 at Cincinnati as guest of the Cincinnati Landscape Association. The air-conditioned Netherland Plaza hotel will be headquarters; no reservations are necessary. Herman Brummé is in charge of entertainment and Robert DuBois of transportation.

Registration and committee meetings are planned for Friday morning. A business meeting, beginning at 2 p. m., will be concluded by an informal buffet lunch at 5 o'clock. Dinner and entertainment will start at 7 p. m., followed by an evening of dancing.

Saturday morning an automobile trip through two of the largest and most beautiful parks in the middle west, through the millionaire country estate section and through the city forest at Mount Airy will precede luncheon, which will be served in a suburban garden.

Nurserymen of neighboring states are cordially invited to be present at this meeting.

NUT GROWERS TO MEET.

The twenty-eighth annual convention of the Northern Nut Growers' Association will be held in Washington, D. C., September 13 and 14. The usual preliminary discussion of business matters will take place Sunday evening, September 12. After a short business session, at which committee reports will be given, the remainder of Monday morning and afternoon will be devoted to 10-minute talks followed by 5-minute discussions. Monday evening Dr. J. Russell Smith, author of "Tree Crops, a Permanent Agriculture," will deliver an illustrated lecture on tree crops.

Tuesday will be given over to speakers whose subjects include matters pertaining to orchard and nursery, to weather and its relation to horticulture, to the marketing outlook for northern nuts and to genetics. F. D. Richey, chief of the bureau of plant industry; Dr. H. L. Crane, principal horticulturist in charge of nut cultural investigations for the bureau of plant industry, and possibly Secretary Wallace will be among the speakers. The Tuesday afternoon session will be held in the auditorium of the Department of Agriculture in Washington, but all other sessions, unless otherwise announced, will be held in the lecture room of the Horticultural building of the University of Maryland, College Park, Md., just outside the District of Columbia, on U. S. highway No. 1 toward Baltimore. Field trips to near-by nut plantings are being arranged for September 15.

All persons interested in nut culture, whether members or not, are invited to attend the meetings.

NEW YORK STATE FAIR EXHIBIT.

A part of the exhibit of the agricultural experiment station, Geneva, N. Y., at the state fair to be held at Syracuse in September will be a miniature nursery depicting the development of nursery stock from the seedling to the budded tree ready to set in the orchard.

Another section of the exhibit will be a regulation roadside stand in which will be found attractively arranged displays of the best varieties of fruits for different seasons and for different uses as a demonstration to the fruit grower as to what varieties should be planted and to the consumer as to what to look for to secure greatest satisfaction. In addition, the station fruit specialists will have a large display of new fruit varieties developed at Geneva, together with new varieties from other sources which are showing promise in tests on the station grounds.

THE Kerr Nursery Co., Sherman, Tex., has been merged with the Sherman Nursery Co., Sherman, Tex., and in the future will operate as a retail nursery under the name of the Sherman Nursery Co.

MASSACHUSETTS MEETING.

In keeping with the return of confidence resulting from more profitable operations, the nurserymen in their meeting at Massachusetts State College, Amherst, July 28, turned their attention to some of the technical problems of plant production.

The morning session, after a greeting by Dr. R. A. Van Meter, head of the division of horticulture at the college, started with a brief discussion of trends and styles in plants and gardening by George Graves, assistant research professor at the Waltham field station. In addition to describing the work of evaluation of herbaceous plants now starting at Waltham, Mr. Graves checked the findings of a recent survey of woody plants with his audience. One interesting conclusion well established from the floor of the meeting was that yellow evergreens of any sort are now decidedly unpopular and are poor investments as merchandise.

Prof. William Doran presented specific results of trial work with cuttings of various sorts. His conclusions were that the so-called plant hormones could be, on occasion, beneficial, detrimental or unnecessary and that, under nursery conditions, the seasons of taking cuttings are still a most important factor. His general conclusion was that each propagator must still master the problem of adapting his individual practice to the local conditions under which he must work.

Arnold Davis, extension horticulturist at the college, developed the idea that the nurseryman in his public relations could profit by assuming more fully his rightful position as a disseminator of horticultural advice and information. Mr. Davis emphasized the public desire for mixed plantings of coniferous and deciduous materials and the fact that most nurserymen should stock plants of popular annual plants.

To start the afternoon session, Ralph W. Donaldson, extension agronomist of the college, discussed some of the principles of soil composition and improvement and fertilizers from the scientific point of view.

Richard Wyman, of the Bay State Nurseries, Framingham, Mass., told of the methods by which he has successfully held his light soils in good condition with cover crops, successions of naturally complementing crops—evergreens after deciduous plants, etc.—uncrowded planting and the use of commercial fertilizers.

OBITUARY.

Mrs. Henry Dues.

Mrs. Julia Dues, owner of the Dickinson Nursery, Dickinson, Tex., and widow of Henry Dues, nurseryman, died at St. Mary's infirmary, Galveston, July 23. She was born at Hitchcock, in 1891, and was a lifelong resident of Galveston county.

The survivors include two daughters, Dorothy Lee and Rose Mary Dues; her mother, Mrs. Julia Barbeaud, Alta Loma; three sisters, and a brother.

THE landscaping at the federal housing project at Charleston, S. C., has been done by Harkey Bros. Nursery, Inc., Charlotte, N. C.

CALIFORNIA'S NEW CHIEF.

The California state department of agriculture has announced the appointment of Joseph Lee Hewitt, deputy county agricultural commissioner of Orange county, Cal., residing at Santa Ana, as chief of the department's bureau of nursery service. Mr. Hewitt, who was selected for the position following a civil service examination, will fill the post at Sacramento, Cal., held by the late J. D. Meriwether. He has had thirty-two years' experience in agricultural education and enforcement.

The new nursery service chief was born in 1881 in Denver, Ind. He is a graduate of the University of Missouri. In addition to his university education in Missouri, Mr. Hewitt had one year of agricultural education at the University of Kansas and further agricultural training and experience at the University of California. He started his career as an assistant instructor in horticulture, nursery practice and plant pathology at the University of Arkansas, where he became professor in 1916. He has also been field assistant for the United States Department of Interior; secretary and chief inspector for the Arkansas state plant board for the first two years of its existence; agricultural secretary for the Texarkana chamber of commerce; chemist for California Sprayer Co., Los Angeles; senior inspector in the Los Angeles county agricultural commissioner's office; teacher of agriculture at Antelope Valley high school, Lancaster, Cal., and inspector, then deputy county agricultural commissioner of Orange county. Mr. Hewitt has been deputy agricultural commissioner in Orange county since 1931.

BULLETINS RECEIVED.

"Fertilizing Deciduous Fruit Trees in California," bulletin 610 of California agricultural experiment station, Berkeley, by E. L. Proebsting, summarizes the results of a number of experiments conducted under different conditions in various parts of the state. In few, if any, well authenticated cases have trees responded profitably to phosphate applications. The response to potassium under conditions in California has been negligible. In two limited areas where definite response was secured, the cost was prohibitive. This leaves nitrogen as the only major fertilizer normally to be considered in the orchard program. The data presented indicate a common but not universal response to this element. In California orchards the choice of the nitrogen-bearing material usually depends primarily on price, with the exception of cyanamide, which should be applied only on neutral or acid soils and then only with precautions against damage.

"The Toxicity of Combinations of Nicotine, under Michigan Conditions, to the Tree and to the Codling Moth," technical bulletin 154 of Michigan agricultural experiment station, East Lansing, by J. M. Merritt, contains conclusions of tests, conducted in 1934 and 1935, utilizing the organic insecticide nicotine as the active principle. Under the conditions prevailing in Michigan during those two seasons, codling moth control is entirely satisfactory when this material is used in cover sprays, provided the interval between sprays does not exceed the period of toxicity of each application. This affords a substitute insecticide for inclusion in the spraying program of growers who find it impractical to attempt removal of arsenical or lead residues. These experiments indicate that no more practical nicotine combination than summer oil and nicotine sulphate has been found.

"The Dutch Elm Disease, a New Threat to the Elm," is the title of bulletin No. 343, Massachusetts agricultural experiment station. Written by Malcolm A. McKenzie and William B. Becker, this 16-page bulletin is intended to supply basic information concerning the characteristics and spread of the Dutch elm disease; it concisely explains the distribution, symptoms, causal organism, methods of spreading and control practices, for, although the disease has not yet been found in Massachusetts, it constitutes a serious threat to the state's principal shade trees.

BUSINESS RECORDS.

Eatontown, N. J.—John S. Applegate was appointed receiver for the purpose of taking over the personal property of the Shrewsbury Nurseries, Inc., and proceeding to foreclose a chattel mortgage held by the First National Bank of Eatontown in the Court of Chancery at Red Bank, N. J., July 20. The court ruled that the growing nursery stock on the grounds of the Shrewsbury Nurseries, Inc., was personal property and that it was covered by the chattel mortgage. Two holders of mortgages on the real estate had claimed that the growing trees and plants were a part of the land and covered by their mortgages.

RECENT PLANT PATENTS.

Plant patents recently issued by the United States patent office, according to Rummler, Rummler & Woodworth, Chicago patent lawyers, were as follows:

No. 254. Rose. Wilhelm Kordes, Sparrieshoop, Germany, assignor to Jackson & Perkins Co., Newark, N. Y. A new and distinct type of decorative or bedding yellow rose plant, characterized by the immunity of its foliage to diseases, the distinctive yellow color of its flower and the fastness of this color.

No. 255. Gladiolus. Elizabeth A. Briggs, Encinitas, Cal. A variety of gladiolus plant characterized particularly by the unusual beauty and smoothness of color, together with the unusual height, vigor and productivity, combined with exceptional keeping qualities and size of bloom.

No. 256. Rose. Frederick Huber Howard, Montebello, Cal. A new and distinct variety of rose plant, characterized particularly by its vigorous growth and lavish production of deep red blooms, which retain their color without bluing, and by its intense fragrance unusual in red roses.

No. 257. Hybrid perpetual rose. Martin R. Jacobus, Ridgefield, N. J. A hybrid perpetual rose characterized by a yellowish copper red bud of medium size tending to globular form; the bloom being double, of good size, possessing lasting qualities and intensely fragrant, having the odor of Rosa damascena, with the high color generally of the Austrian Copper rose except at the base and back of the petals, where yellow predominates and merges into the copper red color of the bloom proper; the foliage being abundant, of large size, more glossy than that of Rosa damascena and of a dark green color, with three, five and seven leaflets, having sharper serrations than Rosa damascena, and the canes of the plant being moderately thorny and of vigorous, superior growing qualities, attaining a height in excess of six feet.

No. 258. Apple tree. Paul L. Lingamfelter, Hedgesville, W. Va., assignor to Stark Bros. Nurseries & Orchards Co., Louisiana, Mo. A new and distinct variety of apple tree characterized by its all-over-red coloring and the earliness in the season of such coloring.

No. 259. Rose. John Square, Painesville, O. A rose plant characterized by its hardiness, its luxurious growth and climbing tendencies, its large double yellow flower, its recurrent blooming and its blooming high up on green canes.

No. 260. Carnation. Charles Augustus Schaefer, York, Pa. A new variety of carnation, characterized particularly by its clean, healthy growth; strong, rigid stems, which continue long throughout the season; ease of reproduction; production of a great number of blooms, which continue large throughout the season and which are full-petaled blooms of a distinctive rose color, with heavy nonsplitting calyx.

CATALOGUES RECEIVED.

[In writing for a copy of any of the catalogues reviewed below, please mention that you saw it described in The American Nurseryman.]

Pfeiffer Nursery, Winona, Minn.—Wholesale price list, peonies and irises, fall 1937, six large pages, offers a few hardy perennials in addition to peonies and irises.

Rocky Mountain Evergreen & Nursery Co., Evergreen, Colo.—Price list on evergreens, tree seeds and other Colorado-grown plants.

R. M. Kellogg Co., Three Rivers, Mich.—"Garden Beauty Book, Fall 1937," twenty-four pages with most of the illustrations in color, offers at retail prices poppies, hyacinths, croci, narcissi, peonies and tulips.

Henry Le Poire, Zeeland, Mich.—Wholesale price list of hardy phlox, four pages.

Hoodacres Originating Gardens, Troutdale, Ore. —"Delphinium Information Book" of forty pages, summer 1937, spring 1938, offers Japanese irises, hybrid hencheras, poppies, hemerocallis, aquilegias, campanulas, lithospermums, aubrietias and hybrid lupines in addition to delphiniums. Cultural directions are included.

Wayside Gardens, Mentor, O.—Wholesale catalogue, fall 1937, sixty-four pages, lists Berberis Mentorensis, tulips, hyacinths, croci, narcissi, lilies, miscellaneous bulbs, roses, delphiniums, irises, peonies, phloxes, hardy border and rock plants, hedge plants, vines, grass seed mixtures and supplies.

Harmel Peony Co., Berlin, Md.—Twenty-sixth annual catalogue, fall 1937, is a 24-page, green-covered pamphlet offering a wide selection of peonies at retail prices.

J. C. Nicholls, Ithaca, N. Y.—An 8-page pamphlet advertises a 1937 clearance sale of irises and peonies to make room for seedlings.

Las Positas Nursery, Santa Barbara, Cal.—Supplementary list for dealers of bulbs for winter delivery, 1937-1938, quotes prices on Milla biflora, Morea polystachya and Zephyranthes robusta.

Gardens of the Blue Ridge, Ashford, N. C.—"Ornamental Plants for Immediate Effects" is a 32-page fall pamphlet listing hardy native deciduous and evergreen trees and shrubs, ferns, lilies, bulbous plants, orchids and herbaceous perennials and hardy vines, climbers, creepers, aquatic and bog plants.

Edward Auten, Jr., Princeville, Ill.—Three lists; one retail and two wholesale. The 12-page retail catalogue offers 160 selected varieties in a "Standard List." 130 Auten originations including fourteen 1937 introductions, seventeen unnamed advanced trial seedlings and four Glasscock originations. One of the two sheets listing wholesale prices offers 104 standard varieties; the other offers the 130 Auten originations.

William N. Craig, Weymouth, Mass.—Autumn price list of hardy liliums, Dutch bulbs and native American plants, forty-four pages, includes lilium seeds in its listing.

Edgar L. Kline, Oswego, Ore.—"Lilies for Garden and Greenhouse, 1937-1938 Descriptive List," 20-page pamphlet with green cover, offers lily bulbs and seeds, spray and dust materials and bamboo stakes and gives a description of lily types and notes on lily culture. An order sheet and two wholesale lists are inclosed, one for importations and the other for bulbs grown in the northwest.

Jacob Sass, Maple Road Gardens, Omaha, Neb. —"Sass Iris List 1937," an 8-column folder, lists five Sass irises that are hybrids between the oncocyclus hybrids and dwarf bearded hybrids, six new 1937 Sass irises, eighty-five more Sass irises and fifteen other named varieties.

Henry F. Michell Co., Philadelphia, Pa.—Fall wholesale catalogue of bulbs, seeds and plants has sixty-four pages of which fourteen list bulbs; four, plants for florists; four, hardy perennial plants; twelve, flower seeds; one, grass seeds; one, farm seeds; nine, horticultural supplies and equipment; thirteen, florists' supplies, and three, spray and dust materials and fertilizers. An inclosed sheet lists wholesale prices on tulips which were omitted from the catalogue.

The Chugai Nursery Co., Yamamoto, Kawabegun, near Kobe, Japan.—Descriptive catalogue of seeds, plants and bulbs, 1937-8, twenty-six pages, lists seeds of evergreen and deciduous trees and shrubs, flowers, etc., and plants and bulbs of dwarf trees, tree and herbaceous peonies, irises, etc., as well as fern balls, dried leaves and other sundries. The cover is decorated with a colored illustration of flower cabbage, or ornamental kale, that has not been introduced on the American market. Prices quoted in American money, f.o.b. Kobe.

A. M. Grootendorst, Benton Harbor, Mich.—Wholesale price list of four large pages includes bulbs, plants and roots for fall delivery—tulips, irises, peonies, phlox, chrysanthemums, lilies, dahlias, gladioli, etc.

Kingsley Fruit Farm & Nursery, Kingsley, Bordon, Hants, England.—Trade list, four pages of strawberry, raspberry and black currant plants.

A. M. Conrade, Yew Tree Nurseries, Northenden, Manchester, England.—Two catalogues: One lists chrysanthemums, twelve pages in a blue cover; the other, dahlias, sixteen pages in a green cover; both are trade lists for 1937 and both include a wide selection of varieties.

K. Velthuys & Co., Ltd., Hillegom, Holland.—Wholesale catalogue, 1937, fifty-two pages, offers hyacinths, tulips, daffodils, croci, amaryllises, anemones, begonias, dahlias, delphiniums, gladioli, irises, etc. Prices quoted in English money.

ROSE REGISTRATIONS.

The American Rose Society's registration committee has approved applications for registration of the following roses. Notice of these registrations has been sent to rose organizations in foreign countries and trade papers.

If no objections are raised before August 27, 1937, the registration of these names will become permanent as of that date:

Climbing Olympiad. Climbing hybrid tea. Discovered by Frank C. Raffel, Stockton, Cal. Said to be a sport of Olympiad. The flowers are the same color as those of Olympiad, but with longer buds and larger flowers. Growth is moderate, and it is claimed to be a continuous bloomer from May to November.

Nubian. Climbing hybrid perpetual. Originated by Bobbink & Atkins, Rutherford, N. J. Parentage unknown. Flowers, type of George Dickson, dark velvety red, slightly fragrant. Growth is given as from five to eight feet high, and a suggestion is given that the plant makes a good pillar. It is once-blooming, in June only.

Gilda. Hybrid tea. Originated by Edward Towill, Roslyn, Pa. Said to be a cross of Souv. de Claudius Pernet x (Lady Hillingdon x Harry Kirk). Flowers, type of Harry Kirk, pure orange yellow, large, double, good-lasting quality and of moderate fragrance. Growth is reported as vigorous; quantity of bloom abundant and continuous.

Poinsettia. Hybrid tea. Originated by Howard & Smith, Montebello, Cal. Said to be a seedling of unknown parentage. Bright scarlet flower of Killarney type, large, open, double, good-lasting quality and slightly fragrant. Plant is described as vigorous, upright, compact and blooming abundantly from May to November.

Baby Chateau. Hybrid polyantha. Originated by W. Kordes & Son, Sparrieshoop, Germany. To be introduced in the United States by Henry A. Dreer, Inc., Philadelphia, in 1938. Said to be a seedling of unknown parents. A deep crimson polyantha of the type of Mrs. R. M. Finch, with medium, semidouble flowers, cupped and with a slight fragrance. Plant is reported as vigorous, open habit, upright and blooming continuously from May to November.

Pink Charm. Hybrid polyantha. Originated by W. Kordes & Son, Sparrieshoop, Germany. To be introduced in the United States by Henry A. Dreer, Inc., Philadelphia, in 1938. Said to be a seedling of unknown parentage. A clear, deep pink flower of Gruss an Aachen type, with double flowers of medium size, full and with slight fragrance. Plant is described as upright, compact, twelve inches tall, with normal green foliage. Is said to be a continuous bloomer from May to October.

Smiles. Hybrid polyantha. Originated by J. H. Nicolas, Newark, N. Y. Said to be a seedling of Echo x Rev. F. Page-Roberts. Flower is said to be of the type of Echo and opens pink with a salmon overcast, finishing pale pink. Flower is described as of medium size, semidouble, open and with a slight fragrance. Growth is described as fifteen to eighteen inches tall. It is said to be a continuous bloomer from June to October.

Golden Light. Large-flowered climber. Said to be a seedling of unknown Wichuraiana seedlings. Originated by J. H. Nicolas, Newark, N. Y. The flower is described as of the type of Dr. Van Fleet, of orange apricot, finishing buff, with an overcast of pink at edge of the petals. Large, double, open and of slight fragrance. Plant is described as somewhat like Dr. Van Fleet and blooms abundantly for three weeks in June.

King Midas. Hybrid polyantha. Originated by J. H. Nicolas, Newark, N. Y. Said to be a seedling of Rochester and Mary Hart. Flower is described as of Gruss an Aachen type, of solid sunflower-yellow, fading little and lasting for many days. Large, double, globular and of slight fragrance. Plant is described as fifteen to eighteen inches tall, blooming continuously from June to October.

June Morn. Large-flowered climber. Originated by J. H. Nicolas, Newark, N. Y. Said to be a seedling of Mme. Gregoire Staechelin and Climbing Souv. de Claudius Pernet. Flower is described as a large hybrid tea bloom of Austrian Copper type, with pale yellow outside and carmine inside. Large, double, high-centered and of moderate fragrance. The plant is described as being a most vigorous climber, blooming continuously for three weeks in June, with occasional flowers during the summer.

R. Marion Hatton, Sec'y.

CHARLES W. MCNAIR, nurseryman of Dansville, N. Y., estimates that he has incurred a loss of upward of $10,000 because of deer's ravaging his trees. The chief loss has been 1-year-old sour cherry buds, although the deer also like plum and pear trees. Mr. McNair has applied to the state conservation department for a permit to shoot the deer. Mr. McNair is a former president of the New York State Nurserymen's Association.

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